In Situ and Remote Monitoring of Water Quality in Puget Sound: the ORCA Time-Series at Pt. Wells

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We obtained high frequency measurements of chemical, physical, and biological properties throughout the water column at a fixed station in north Puget Sound using an autonomous moored profiling system. Measurements were taken every two to six hours between September 2003 and December 2004 using surface meteorological sensors and a profiling underwater instrument package consisting of a Seabird CTD, dissolved oxygen electrode, Wetlabs transmissometer and chlorophyll fluorometer. In April 2004 we incorporated a WS Ocean EcoLab in situ nutrient analyzer, thereby adding a NO3- time-series to our dataset. During the summer growing season the water column fluctuated between periods of stratification and deep vertical mixing. Oxygen saturation varied from near saturation (~90-100%) at depth and supersaturation (~150%) at the surface. NO3- concentrations at the surface fluctuated throughout the summer, while concentrations at depth remained consistent around 15-20 uMol. Chlorophyll, oxygen and NO3- co-varied at the surface, with large chlorophyll blooms (over 15 mg/m3) occurring with oxygen supersaturation, directly followed by a sharp decrease in NO3- concentrations at the surface and 10 meters depth.